



## New 8<sup>th</sup> Edition of the Karlsruhe Nuclide Chart

Z. Solti<sup>1</sup>, G. Pfennig<sup>1</sup>, R. Dreher<sup>2</sup>, J. Magill<sup>2</sup>

<sup>1</sup> - European Commission, Joint Research Centre, Institute for Transuranium Elements, Postfach 2340, 76125 Karlsruhe Germany  
<sup>2</sup> - Nucleonica GmbH, 76344 Eggenstein-Leopoldshafen, Germany

For more than 50 years, the Karlsruhe Nuclide Chart has provided scientists and students with structured, accurate information on the half-lives and decay modes of radionuclides, as well as the energies of emitted radiation. Beyond the more traditional physical sciences such as health physics and radiation protection, reactor physics, nuclear and radiochemistry, and astrophysics, the Chart is now in wide and common usage in the life and earth sciences (biology, medicine, agriculture, geology, etc.).

### The new 8<sup>th</sup> edition

Since the previous edition, much progress has been made in the observation of new nuclides and the determination of basic nuclear data. This progress is summarized in lower chart. The new 8<sup>th</sup> edition contains experimental data on 118 elements, 3130 ground states and 712 isomers. This data comprises of half-lives, branching ratios and decay modes, and energies of the emitted radiations. In addition, most recent values of the atomic weights, isotopic abundancies and cross sections are included together with the thermal fission yields for both <sup>235</sup>U and <sup>239</sup>Pu.

A unique feature of the chart is colour coded information on main and subsidiary decay modes.

The accompanying booklet includes a multi-lingual explanation of the chart. (English, German, French, Spanish, Chinese, Russian)



### "Difference" chart

The lower chart highlights the differences between the previous 7<sup>th</sup> and the new 8<sup>th</sup> edition of the Karlsruhe Nuclide Chart. In this "difference" chart, the coloured boxes indicate new nuclides and updated nuclear data not found in the previous 7<sup>th</sup> edition. Nuclides with unchanged nuclear data are shown as grey boxes.

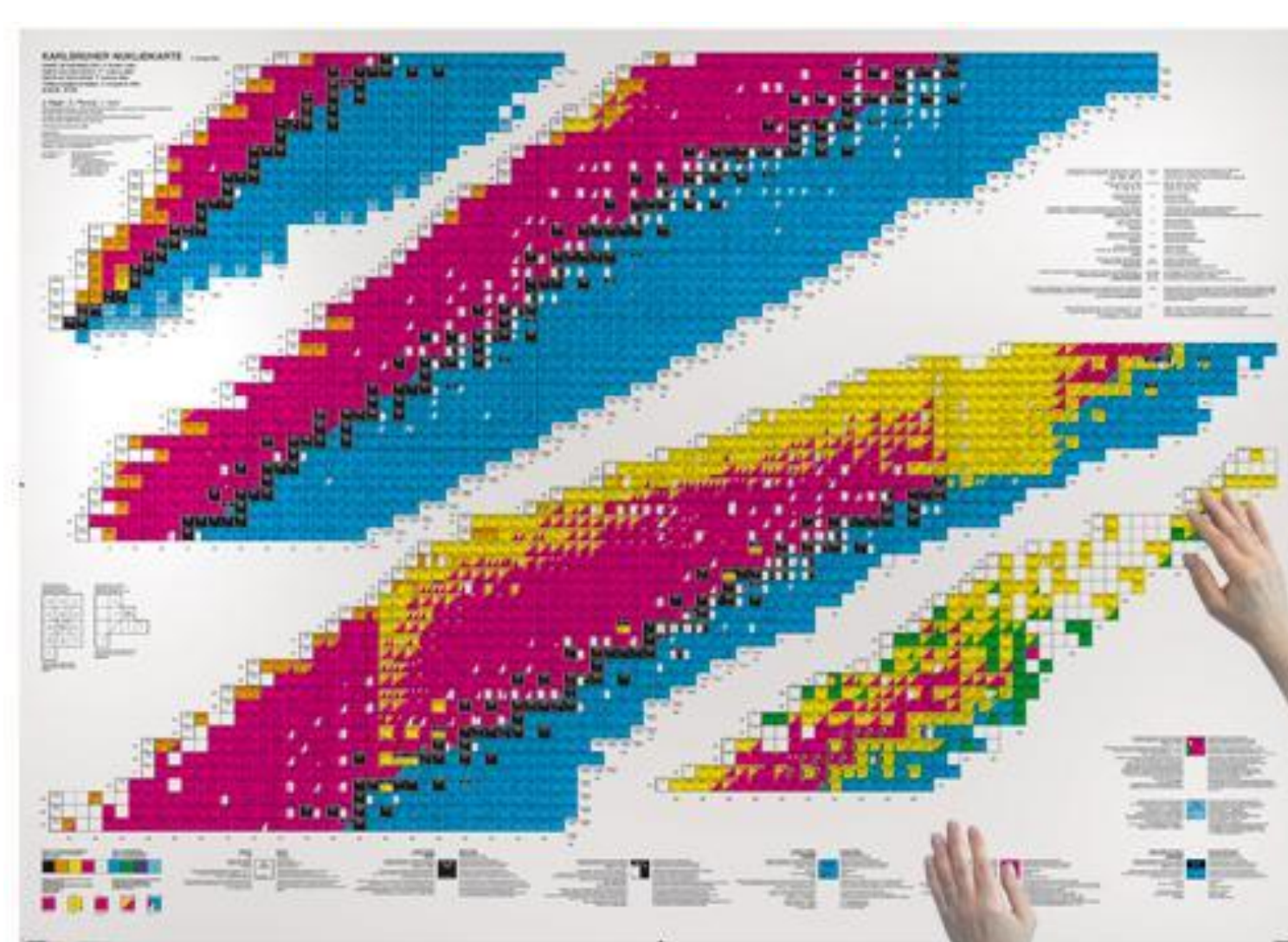
In summary, the new 8<sup>th</sup> edition contains information on new element 117, 170 new ground states, 20 new isomeric states. New and updated experimental data on more than 500 ground and isomeric states are presented.

Over the last year alone, more than 100 new nuclides have been discovered using the latest experimental techniques in different laboratories world-wide. The new nuclide "clusters" observed in the difference chart above are a reflection of new machine developments and improvements at major nuclear centres such as the Joint Institute for Nuclear Research, Dubna, Russia; GSI Helmholtzzentrum for Heavy Ion Research, Darmstadt, Germany; Lawrence Berkeley National Laboratory, Berkeley, USA; Nishina Centre for Accelerator Based Science, RIKEN, Wako, Japan.

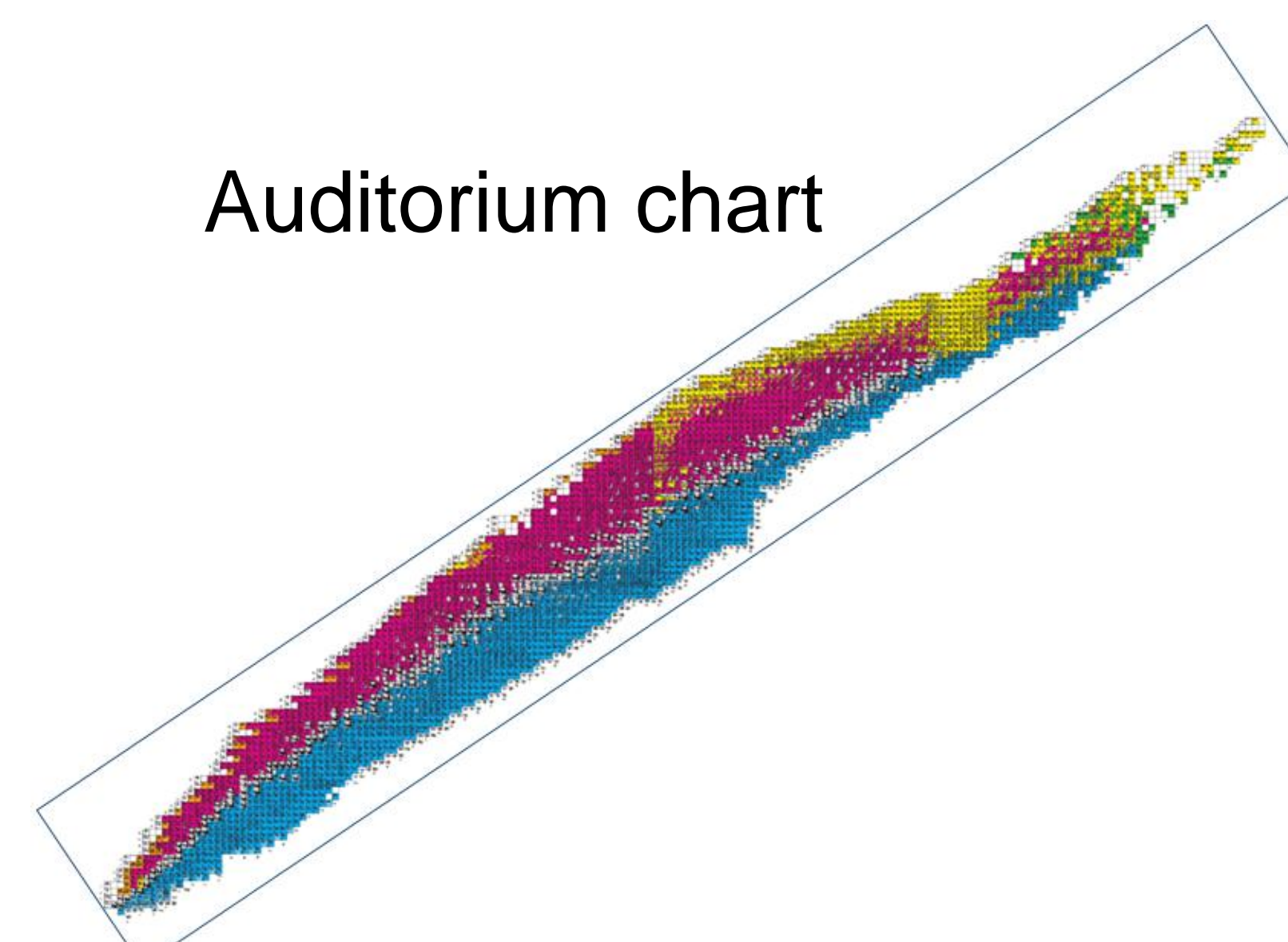
### Available paper based charts



Fold-out chart



Wall chart



Auditorium chart

Further information: [www.karlsruhenuclidechart.net](http://www.karlsruhenuclidechart.net)

#### Contact

**Zsolt Solti**  
 European Commission • Joint Research Centre  
 Institute for Transuranium Elements  
 Tel. +49 7247 951143 • Fax +49 7247 95199366  
 E-mail: [zsolt.soti@ec.europa.eu](mailto:zsolt.soti@ec.europa.eu)